

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.
2. Authorization for this examiner's amendment was given in a telephone interview with Mr. Robert Kowert on April 21, 2011.
3. Please replace all prior claims versions and/or listing with the following:
 1. A computer implemented method, comprising:
determining if servicing a consume request for a resource would cause a threshold rate that corresponds to the requested resource to be exceeded, wherein the consume request is received from one of a plurality of resource consuming isolates that are bound to one of a plurality of resource domains in which one or more respective resource policies for the requested resource are installed, and wherein the consume request specifies a measurable, consumable resource to be consumed during execution of one or more computations of the one of the plurality of resource consuming isolates; and

if the threshold rate would be exceeded, then delaying servicing of the request for at least a period of time sufficient to avoid exceeding the threshold rate;

wherein the threshold rate is specified in one of the one or more respective resource policies installed in the one of the plurality of resource domains that are bound to the one of the plurality of resource consuming isolates;

wherein the one of the plurality of resource domains associates the one of the one or more respective resource policies for the requested resource with the plurality of resource consuming isolates that are bound to the one of the plurality of resource domains; and

wherein an isolate is a set of one or more computations that do not share computational state with other computations;

wherein said determining and said delaying are performed by a first isolate that monitors and controls resource requests for the resource and that is separate from the implementation of the resource, and wherein the first isolate monitors and controls resource requests for the resource based at least in part on a set of common attributes used to characterize the resource, wherein the set of common attributes is usable to characterize resources with respect to consuming or releasing the resources for a plurality of different resource types.

2. The method of claim 1, wherein ~~[[a]]~~ said determining comprises the first isolate ~~resolves~~ resolving a trigger that determines if the threshold rate would be exceeded ~~and delays servicing of the request, wherein the first isolate is an isolate that monitors and controls resource requests for the resource separate from the implementation of the resource.~~

3. The method of claim ~~[[2]]~~ 1, ~~wherein the first isolate monitors and controls resource requests based at least in part on a set of common attributes used to characterize the resource,~~ wherein the set of attributes comprises one or more attributes indicating whether the resource is one or more of: disposable, revocable, reservable, ~~[[and]]~~ or bounded.

4. The method of claim 2, wherein the trigger is specified by a second isolate.

5. The method of claim 4, wherein the second isolate installs the trigger in the one of the plurality of resource domains and the first isolate determines the trigger from the one of the plurality of resource domains.

6. The method of claim 1, wherein the threshold rate indicates a maximum allowable resource usage by a particular resource consumer within a given interval.

7. The method of claim 6, wherein the resource consumer comprises a client, an isolate, a process, or an application.

8. The method of claim 6, further comprising recording previous consume requests from the resource consumer.

9. The method of claim 6, further comprising recording previously consumed amounts of the resource.

10. The method of claim 9, further comprising purging those recorded previously consumed amounts of the resource that fall beyond the given interval.

11. The method of claim 9, wherein said determining comprises:

determining a current usage of the requested resource;

determining a potential usage of the resource based at least in part on the consume request;

determining previously consumed amounts of the resource within a given interval from the recorded previous consumed amounts; and

determining if the threshold rate will be exceeded based at least in part on the current usage, the potential usage, and the previously consumed amounts of the resource.

12. The method of claim 11 wherein said determining if the threshold rate will be exceeded is in accordance with the following, wherein previouslyconsumedamount indicates the amount of the resource previously consumed within the given interval:

$$\text{amount_over_threshold} = \text{potentialusage} - \text{currentusage} + \text{previouslyconsumedamount} - \text{threshold}.$$

13. The method of claim 12 wherein the period of time is determined with the following:
$$\text{period_of_time} = (\text{amount_over_threshold} / \text{threshold}) * \text{interval}.$$

14. The method of claim 1, wherein said delaying servicing of the request comprises sleeping for the period of time.

15. The method of claim 1, wherein said determining if the threshold rate is exceeded comprises:

determining a rate of requests for the resource from a particular resource consumer; and

comparing the rate of requests against the threshold rate, wherein the threshold rate indicates a maximum number of allowable requests for the resource within a given interval.

16. The method of claim 15, wherein said determining the rate of requests comprises:

determining a number of requests for the resource received from the particular resource consumer over the given interval.

17. The method of claim 1, embodied as a computer program product encoded in one or more non-transitory machine-readable storage media.

18. A computer implemented method, comprising:

managing consume requests for a resource that are received from a plurality of computations that consume the resource and that are bound to one of a plurality of resource domains in which one or more respective resource policies for the resource are installed, wherein each of the consume requests specifies a measurable, consumable resource to be consumed during execution of one of the plurality of computations, and wherein said managing consume requests comprises determining whether servicing the consume requests would cause a threshold to be exceeded; and

in response to determining that servicing the consume requests would cause the threshold to be exceeded, throttling one or more of the consume requests for at least a period of time sufficient to avoid exceeding to conform to [[a]] the threshold;

wherein the threshold is specified in one of the one or more respective resource policies installed in the one of the plurality of resource domains that are bound to the plurality of computations, wherein the one of the plurality of resource domains associates the one of the

one or more respective resource policies for the resource with the plurality of computations that are bound to the one of the plurality of resource domains;

wherein said managing consume requests further comprises a dispenser isolate managing resource requests based at least in part on a set of common attributes used to characterize the resource;

wherein the set of common attributes is usable to characterize resources with respect to consuming or releasing the resources for a plurality of different resource types;

wherein an isolate comprises a set of one or more encapsulated computations having a state that is independent of a state of other computations; and

wherein the dispenser isolate is separate from the implementation of the resource.

19. The method of claim 18, wherein said throttling the consume requests comprises delaying those consume requests that would cause the threshold to be exceeded.

20. The method of claim 19, wherein said delaying comprises sleeping for a period of time.

21. The method of claim 20, further comprising:

determining one or more of: a current usage, a potential usage, [[and]] or a previously consumed resource amount within an interval.

22. The method of claim 21, wherein the period of time is determined in accordance with the following:

$$\text{amount_over_threshold} = \text{potential_usage} - \text{current_usage} + \text{previously_consumed_amount} - \text{threshold}; \text{ and}$$
$$\text{period_of_time} = (\text{amount_over_threshold} / \text{threshold}) * \text{interval}..$$

23. The method of claim 18, wherein the threshold comprises a threshold for a consumed resource amount, a threshold for a resource consumption rate, a threshold for a number of resource consume requests, or a threshold for a consume request rate.

24. (Cancelled)

25. The method of claim [[24]] 18, wherein said throttling comprises the dispenser isolate resolving a trigger.

26. The method of claim 25, wherein the trigger is specified by a second isolate.

27. The method of claim 26, wherein said throttling further comprises the second isolate installing the trigger in the one of the plurality of resource domains.

28. The method of claim 18, embodied as a computer program product encoded in one or more non-transitory machine-readable storage media.

29. A non-transitory machine-readable storage medium storing program instructions executable to implement:

a posting facility that posts consume requests for resources;

a rate controller that delays one or more resource consume requests for at least a period of time sufficient to avoid exceeding ~~that will cause a threshold to be exceeded;~~ and

a plurality of resource domains that each associate one or more respective resource policies for a requested resource with a plurality of resource consuming isolates that are bound to the resource domain;

wherein an isolate is a set of one or more computations that do not share computational state with other computations;

wherein consume requests for the requested resource are received from one of the plurality of resource consuming isolates that are bound to one of the plurality of resource domains, and wherein each of the consume requests specifies a measurable, consumable resource to be consumed during execution of one or more computations of the one of the

plurality of resource consuming isolates; [[and]]

wherein the threshold is specified in one of the one or more respective resource policies for the requested resource installed in the one of the plurality of resource domains that are bound to the one of the plurality of resource consuming isolates;

wherein the rate controller is an isolate that is separate from the implementation of the requested resource; and

wherein the rate controller delays resource consume requests based at least in part on a set of common attributes used to characterize the requested resource, wherein the set of common attributes is usable to characterize resources with respect to consuming or releasing the resources for a plurality of different resource types.

30. The storage medium of claim 29, wherein the program instructions executable to implement the posting facility are dependent at least in part on a dispenser class, wherein the dispenser class defines an intermediary set of one or more computations that monitor and control resource requests.

31. The storage medium of claim 30, wherein the program instructions executable to implement the rate controller are dependent at least in part on a trigger class, wherein the trigger

class defines one or more computations that query existence of at least one condition based at least in part on usage of a given resource.

32. The storage medium of claim 29, wherein the threshold comprises a threshold for a consumed resource amount, a threshold for a resource consumption rate, a threshold for a number of resource consume requests, or a threshold for a consume request rate.

33. The storage medium of claim 29, wherein the program instructions executable to implement the rate controller er invoke a sleep computation to delay resource consume requests.

34. The storage medium of claim 33, wherein the program instructions executable to implement the rate controller er [[is]] are further executable to implement determining one or more of: a current resource usage, a potential resource usage, [[and]] or a previously consumed resource amount within an interval.

35. The storage medium of claim 34, wherein a period of time that the sleep computation is invoked is determined in accordance with the following:

amount_over_threshold=potentialusage-currentusage+previouslyconsumedamount-
threshold; and

period_of_time=(amount_over_threshold/threshold)*interval.

36. A non-transitory machine-readable storage medium storing program instructions executable to implement:

a plurality of resource domains each associating one or more respective resource policies for a resource with a plurality of resource consuming isolates that are bound to the resource domain;

a first sequence of instructions determining [[if]] whether servicing a consume request from one of the plurality of resource consuming isolates that are bound to one of the plurality of resource domains will cause a threshold to be exceeded, wherein the consume request specifies a measurable, consumable resource to be consumed during execution of one or more computations of the one of the plurality of resource consuming isolates; and

a second sequence of instructions determining a period of time to delay the request that is sufficient to avoid exceeding the threshold;

wherein an isolate is a set of one or more computations that do not share computational state with other computations;

wherein the threshold is specified in one of the one or more respective resource policies for the requested resource installed in the one of the plurality of resource domains;

wherein at least one of the first sequence of instructions and the second sequence of instructions is an isolate that is separate from the implementation of the requested resource;

wherein at least one of said determining whether servicing a consume request will cause a threshold to be exceeded and said determining the period of time to delay is based at least in part on a set of common attributes used to characterize the requested resource; and

wherein the set of common attributes is usable to characterize resources with respect to consuming or releasing the resources for a plurality of different resource types.

37. The storage medium of claim 36, wherein the threshold comprises a threshold for a consumed resource amount, a threshold for a resource consumption rate, a threshold for a number of resource consume requests, or a threshold for a consume request rate.

38. The storage medium of claim 36, wherein the period of time to delay the request is based at least in part on one or more of: a currently used amount of the resource, a potentially used amount of the resource based on the resource request, a previously consumed amount of the resource, a time interval, [[and]] or the threshold, wherein the previously consumed amount of the resource indicates the amount of previously consumed resource within the interval.

39. The storage medium of claim 38, wherein the period of time is determined according to the following:

$$\text{amount_over_threshold} = \text{potential usage} - \text{current usage} + \text{previously consumed amount} - \text{threshold}; \text{ and}$$

$$\text{period_of_time} = (\text{amount_over_threshold} / \text{threshold}) * \text{interval}.$$

40. The storage medium of claim 36, wherein said delaying the request comprises sleeping.

41. An apparatus, comprising:

system memory; [[and]]

means for determining that servicing a plurality of requests for a resource would cause a threshold to be exceeded; and

means for throttling one or more of the plurality of requests for [[a]] the resource ~~that~~ for at least a period of time sufficient to avoid exceeding the threshold;

wherein the plurality of requests are received from a plurality of resource consuming isolates that are bound to one of a plurality of resource domains in which one or more respective resource policies for the resource are installed ~~to comply with a threshold~~, wherein each of the requests specifies a measurable, consumable resource to be consumed during execution of one or more computations of one of the plurality of resource consuming isolates;

wherein an isolate is a set of one or more computations that do not share computational state with other computations;

wherein the threshold is specified in one of the one or more respective resource policies installed in the one of the plurality of resource domains that are bound to the plurality of resource consuming isolates, wherein the one of the plurality of resource domains associates the one of the one or more respective resource policies for the resource with the plurality of resource consuming isolates that are bound to the one of the plurality of resource domains;

wherein the means for throttling requests is separate from the implementation of the resource;

wherein said throttling requests is based at least in part on a set of common attributes used to characterize the resource; and

wherein the set of common attributes is usable to characterize resources with respect to consuming or releasing the resources for a plurality of different resource types.

42. The apparatus of claim 41, wherein the threshold comprises a threshold for a consumed resource amount, a threshold for a resource consumption rate, a threshold for a number of resource consume requests, or a threshold for a consume request rate.

43. The apparatus of claim 41, further comprising means for determining if the threshold will be exceeded.

44. (Cancelled)

45. The apparatus of claim [[44]] 41, wherein the set of attributes comprises one or more attributes indicating whether the resource is one or more of: disposable, revocable, reservable, [[and]] or bounded.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CAROLINE ARCOS whose telephone number is (571)270-3151. The examiner can normally be reached on Monday-Thursday 8:00 AM to 2:00 PM.

5. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

6. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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